09/914,543

L1 QUE ENDOGLUCANASE OR CELLULASE OR GLYCOSYLHYDROLASE

=> d rank

F1	18585	CAPLUS
F2	10133	BIOSIS
F3	7599	SCISEARCH
F4	6595	BIOTECHABS
F5	6595	BIOTECHDS
F6	6023	USPATFULL
F7	5877	CABA
F8	5686	DGENE
F9	5495	PASCAL
F10	3868	LIFESCI
F11	3698	AGRICOLA
F12	3560	EMBASE
F13	3294	MEDLINE
F14	3188	BIOTECHNO
F15	3017	WPIDS
F16	3017	WPINDEX
F17	2486	GENBANK
F18	2428	FSTA
F19	2295	ESBIOBASE
F20	2127	CEABA-VTB
F21	2019	TOXCENTER
F22	1849	BIOBUSINESS
F23	1823	JICST-EPLUS
F24	1587	IFIPAT
F25	904	FROSTI
F26	518	DISSABS
F27	359	PROMT
F28	358	NTIS
F29	355	USPAT2
F30	315	AQUASCI
F31	276	CONFSCI
F32	267	DRUGMONOG2
F33	228	CROPU
F34	222	VETU
F35	175	FEDRIP
F36	169	BIOCOMMERCE
F37	168	CROPB
F38	148	ANABSTR
F39	114	CIN
F40	113	OCEAN
F41	80	IMSPRODUCT
F42	76	DDFB
F43	76	DRUGB
F44	70	FOREGE
F45	53	DRUGU
F46	44	CANCERLIT
F47	39	DDFU
F48	28	EMBAL
F49	24	CEN
F50	22	HEALSAFE
F51	20	RDISCLOSURE
F52	12	NIOSHTIC
F53	11	PHIN
F54	10	VETB
F55	9	WPIFV
F56	7	KOSMET
F57	4	MEDICONF
F58	3	ADISCTI
F59	1	ADISNEWS
F60	1	SYNTHLINE

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=> file f1-f5, f7, f9-f16
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FULL ESTIMATED COST                                         1.71       1.92

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FILE 'WPIDS' ENTERED AT 14:51:56 ON 14 JUL 2004
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FILE 'WPINDEX' ACCESS NOT AUTHORIZED

=> s l1 and (pyrococcus or furiosus)
L2          167 L1 AND (PYROCOCCUS OR FURIOSUS)

=> s l2 and (isola? or purif? or charac?)
   9 FILES SEARCHED...
L3          115 L2 AND (ISOLA? OR PURIF? OR CHARAC?)

=> dup rem l3
PROCESSING COMPLETED FOR L3
L4           39 DUP REM L3 (76 DUPLICATES REMOVED)

=> d l4 ibb ab 30-39
'IBB' IS NOT A VALID FORMAT
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=> d l4 ibib ab 30-39

L4 ANSWER 30 OF 39 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 1999:934067 SCISEARCH
THE GENUINE ARTICLE: 260GJ
TITLE: Synergistic interactions among beta-laminarinase, beta-1,4-glucanase, and beta-glucosidase from the hyperthermophilic archaeon **Pyrococcus furiosus** during hydrolysis of beta-1,4-, beta-1,3-, and mixed-linked polysaccharides
AUTHOR: Driskill L E; Bauer M W; Kelly R M (Reprint)
CORPORATE SOURCE: N CAROLINA STATE UNIV, DEPT CHEM ENGN, BOX 7905, RALEIGH, NC 27695 (Reprint); N CAROLINA STATE UNIV, DEPT CHEM ENGN, RALEIGH, NC 27695
COUNTRY OF AUTHOR: USA
SOURCE: BIOTECHNOLOGY AND BIOENGINEERING, (5 NOV 1999) Vol. 66, No. 1, pp. 51-60.
Publisher: JOHN WILEY & SONS INC, 605 THIRD AVE, NEW YORK, NY 10158-0012.
ISSN: 0006-3592.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 39
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The synergistic interaction among three p-specific glycosidases from the hyperthermophilic archaeon **Pyrococcus furiosus**, namely two **endoglucanases** (EglA and LamA) and an exo-acting p-glucosidase (Bgl), on barley-glucan and laminarin, was examined. In addition to following glucose release and the generation of reducing sugar ends, the distribution and amounts of oligomeric products from beta-1,3- and beta-1,4-linked substrates were determined as a function of extent of hydrolysis at 98 degrees C. Positive interactions were noted between endo/exo glucanase combinations, leading to enhanced and rapid degradation of the larger complex carbohydrates to oligosaccharides. The EgIA/LamA endo-acting combination was also synergistic in degrading barley-glucan. However, hydrolysis was most efficient when a blend of all three hydrolases was used, possibly due to the relief of product inhibition by the exoglyosidase. Furthermore, by monitoring the distribution of oligosaccharides present during hydrolysis, patterns of enzymatic attack could be followed in addition to determining the specific contributions of each hydrolase to the overall process. (C) 1999 John Wiley & Sons, Inc.

L4 ANSWER 31 OF 39 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 15
ACCESSION NUMBER: 1999:184596 CAPLUS
DOCUMENT NUMBER: 131:41316
TITLE: Thermostable aminopeptidase from **Pyrococcus** horikoshii
AUTHOR(S): Ando, Susumu; Ishikawa, Kazuhiko; Ishida, Hiroyasu; Kawarabayasi, Yutaka; Kikuchi, Hisasi; Kosugi, Yoshitsugu
CORPORATE SOURCE: National Institute of Bioscience and Human-Technology, Tsukuba, Ibaraki, 305-8566, Japan
SOURCE: FEBS Letters (1999), 447(1), 25-28
CODEN: FEBLAL; ISSN: 0014-5793
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB From the genome sequence data of the thermophilic archaeon **Pyrococcus** horikoshii, an open reading frame was found which encodes a protein (332 amino acids) homologous with an **endoglucanase** from Clostridium thermocellum (42% identity), deblocking aminopeptidase from **Pyrococcus furiosus** (42% identity) and an aminopeptidase from Aeromonas proteolytica (18% identity). This gene was cloned and expressed in Escherichia coli, and the **characteristics** of the expressed protein were examined Although **endoglucanase** activity was not detected, this protein was found to have aminopeptidase activity to cleave the N-terminal amino acid from a variety of substrates including both N-blocked and non-blocked peptides. The enzyme was stable at 90°, with the optimum temperature over 90°. The metal ion bound to this enzyme was calcium, but it was not essential for the aminopeptidase activity. Instead, this enzyme required the cobalt ion for activity. This enzyme is expected to be useful for the removal of Nα-acylated residues in short peptide sequence anal. at high temps.

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 32 OF 39 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 16

ACCESSION NUMBER: 1998:543152 CAPLUS
DOCUMENT NUMBER: 129:172455
TITLE: **Isolation**, properties and applications of a thermostable endo-β-1,4-glucanase
INVENTOR(S): Andersen, Lene Nonboe; Bjornvad, Mads Eskelund; Schulein, Martin
PATENT ASSIGNEE(S): Novo Nordisk A/S, Den.
SOURCE: PCT Int. Appl., 57 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9833895	A1	19980806	WO 1998-DK39	19980130
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9856521	A1	19980825	AU 1998-56521	19980130
EP 972016	A1	20000119	EP 1998-900849	19980130
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE, PT, IE, FI				
JP 2001504352	T2	20010403	JP 1998-532468	19980130
JP 3532577	B2	20040531		

PRIORITY APPLN. INFO.:
DK 1997-114 A 19970131
DK 1997-853 A 19970711
WO 1998-DK39 W 19980130

AB This invention relates to an enzyme preparation having endo-β-1,4-glucanase activity which has optimum activity at a temperature of at least 90°C, preferably of at least 95°C, and more preferably of at least 100°C. The preparation may be obtainable from or endogenous to a strain belonging to Archaea, preferably to the phylum Euryarchaeota, and more preferably to the subdivision Thermococcoales and to the species **Pyrococcus furiosus**. In its second aspect, the invention relates to a DNA construct comprising a DNA sequence encoding an enzyme having endo-β-1,4-glucanase activity. The invention also provides a method of producing an enzyme exhibiting cellulolytic activity,

which comprises culturing the cell under conditions permitting the production of the enzyme, and recovering the enzyme from the culture. Industrial application of the enzyme are also described including applications in the textile industry.

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 33 OF 39 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 17
ACCESSION NUMBER: 1997:776184 CAPLUS
DOCUMENT NUMBER: 128:72370
TITLE: **Endoglucanases** gene sequences from thermophilic archael bacteria
INVENTOR(S): Lam, David E.; Mathur, Eric J.
PATENT ASSIGNEE(S): Recombinant Biocatalysis, Inc., USA; Lam, David E.; Mathur, Eric J.
SOURCE: PCT Int. Appl., 125 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9744361	A1	19971127	WO 1997-US8793	19970522
W: AU, CA, IL, JP, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5789228	A	19980804	US 1996-651572	19960522
AU 9732852	A1	19971209	AU 1997-32852	19970522
AU 719444	B2	20000511		
EP 923608	A1	19990623	EP 1997-928650	19970522
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2000512842	T2	20001003	JP 1997-542781	19970522
US 6074867	A	20000613	US 1997-951086	19971015

PRIORITY APPLN. INFO.: US 1996-651572 A2 19960522
WO 1997-US8793 W 19970522

AB The invention provides a **purified** thermostable enzyme derived from the archael bacterium AEPII1a. The enzyme has a mol. weight of .apprx.60.9 kDa and has **cellulase** activity. The enzyme can be produced from native or recombinant host cells and can be used to aid in the digestion of cellulose where desired. Also included are an addnl. 23 genes and their encoded **endoglucanases** having homol. to the AEPII1a enzyme. The **cellulases** enzymes may be used for degradation of cellulose for the conversion of plant biomass into fuels and chems., for use in detergents, the textile industry, in animal feed, in waste treatment, and in the fruit juice/brewing industry for the clarification and extraction of juices.

L4 ANSWER 34 OF 39 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN
ACCESSION NUMBER: 1997-372858 [34] WPIDS
DOC. NO. CPI: C1997-120201
TITLE: New thermostable glycosidase(s) - from Thermococcus, Staphylothermus and **Pyrococcus**, used in the textile, food processing, pharmaceutical, detergent and baking industries.
DERWENT CLASS: B04 D11 D13 D16 D25 F06
INVENTOR(S): BYLINA, E J; LAM, D E; MATHUR, E J; SWANSON, R V
PATENT ASSIGNEE(S): (RECO-N) RECOMBINANT BIOCATALYSIS INC; (DIVE-N) DIVERSA CORP
COUNTRY COUNT: 22
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG

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WO 9725417      A1 19970717 (199734)* EN   82
   RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
    W: AU CA IL JP
AU 9722410      A  19970801 (199748)
EP 912725       A1 19990506 (199922)  EN
    R: AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
AU 726017       B  20001026 (200059)
JP 2002509425   W  20020326 (200236)       80
JP 2004000189   A  20040108 (200405)      103
```

APPLICATION DETAILS:

PATENT NO	KIND		APPLICATION	DATE
WO 9725417	A1		WO 1997-US92	19970110
AU 9722410	A		AU 1997-22410	19970110
			WO 1997-US92	19970110
EP 912725	A1		EP 1997-906876	19970110
			WO 1997-US92	19970110
AU 726017	B		AU 1997-22410	19970110
JP 2002509425	W		JP 1997-525300	19970110
			WO 1997-US92	19970110
JP 2004000189	A	Div ex	JP 1997-525300	19970110
			JP 2003-104557	20030408

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 9722410	A	Based on	WO 9725417
EP 912725	A1	Based on	WO 9725417
AU 726017	B	Previous Publ.	AU 9722410
		Based on	WO 9725417
JP 2002509425	W	Based on	WO 9725417

PRIORITY APPLN. INFO: US 1996-712612 19960913; US 1996-583787 19960111

AB WO 9725417 A UPAB: 20040205

A new **isolated** polynucleotide (I) comprises: (a) a polynucleotide (PN) with at least 70% identity to a PN encoding glycosidase enzymes: Thermococcus chitinophagus M11TL; Thermococcus chitinophagus OC1/4V glycosidase (33B/G); Staphylococcus marinus F1 glycosidase (12G;) Thermococcus 9N2 glycosidase (31B/G); Thermotoga maritima MSB8 glycosidase (6G); Thermococcus AEDII12RA glycosidase (18B/G); Thermococcus chitinophagus GC74 glycosidase (22G); **Pyrococcus furiosus** VC1 glycosidase (7G1); Bankia gouldi **endoglucanase** (37GP1); Thermotoga maritima alpha -glycosidase (6GC2); Thermotoga maritima beta -mannanase (6GP2); Thermococcus AEPII 1a beta -mannosidase (63GB1); Thermococcus chitinophagus OC1/4V **endoglucanase** (33GP1); or Thermotoga maritima pullulanase (6GP3) (full DNA and amino acid sequences are given in the specification); (b) a PN (Ia) complementary to (I); or (c) a PN with at least 15 bases (I) or (Ia).

Also new are: (1) a vector containing (I); (2) a host cell containing the vector of (1); and (3) an enzyme (A) having an amino acid (aa) sequence which is at least 70% identical to the aa sequences encoded by the PNs above, or an enzyme which has at least 30 aas of (A).

USE - The enzymes or PNs are used for generating glucose from soluble oligosaccharides. The enzyme can be used in the food processing, pharmaceutical, textile, detergent and baking industries. The enzymes are also used to treat lactose intolerance, as a diagnostic reporter molecule, in corn wet milling or in the fruit juice industry. The enzymes can be used to hydrolyse guar gum to remove non-reducing terminal mannose

residues. The PNs may be used to generate probes to identify similar sequences.
Dwg.0/14

L4 ANSWER 35 OF 39 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 18
ACCESSION NUMBER: 1997:800677 CAPLUS
DOCUMENT NUMBER: 128:164236
TITLE: Molecular and biochemical **characterization** of an endo-β-1,3-glucanase of the hyperthermophilic archaeon **Pyrococcus furiosus**
AUTHOR(S): Gueguen, Yannick; Voorhorst, Wilfried G. B.; Van Der Oost, John; De Vos, Willem M.
CORPORATE SOURCE: Bacterial Genetics Group, Department of Microbiology, Wageningen Agricultural University, Wageningen, NL-6703 CT, Neth.
SOURCE: Journal of Biological Chemistry (1997), 272(50), 31258-31264
CODEN: JBCHA3; ISSN: 0021-9258
PUBLISHER: American Society for Biochemistry and Molecular Biology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors report here the first mol. **characterization** of an endo-β-1,3-glucanase from an archaeon. **Pyrococcus furiosus** is a hyperthermophilic archaeon that is capable of saccharolytic growth. The **isolated** lamA gene encodes an extracellular enzyme that shares homol. with both endo-β-1,3- and endo-β-1,3-1,4-glucanases of the glycosyl hydrolase family 16. After deletion of the N-terminal leader sequence, a lamA fragment encoding an active endo-β-1,3-glucanase was overexpressed in Escherichia coli using the T7-expression system. The **purified** P. **furiosus endoglucanase** has highest hydrolytic activity on the β-1,3-glucose polymer laminarin and has some hydrolytic activity on the β-1,3-1,4 glucose polymers lichenan and barley β-glucan. The enzyme is the most thermostable endo-β-1,3-glucanase described up to now; it has optimal activity at 100-105°. In the predicted active site of glycosyl hydrolases of family 16 that show predominantly endo-β-1,3-glucanase activity, an addnl. methionine residue is present. Deletion of this methionine did not change the substrate specificity of the **endoglucanase**, but it did cause a severe reduction in its catalytic activity, suggesting a structural role of this residue in constituting the active site. High performance liquid chromatog. anal. showed in vitro hydrolysis of laminarin by the endo-β-1,3-glucanase proceeds more efficiently in combination with an exo-β-glycosidase from P. **furiosus** (CelB). This most probably reflects the physiol. role of these enzymes: cooperation during growth of P. **furiosus** on β-glucans.
REFERENCE COUNT: 65 THERE ARE 65 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 36 OF 39 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN
ACCESSION NUMBER: 1997-09654 BIOTECHDS
TITLE: Cloning, sequencing, **characterization**, and expression of an extracellular alpha-amylase from the hyperthermophilic archaeon **Pyrococcus furiosus** in Escherichia coli and Bacillus subtilis; thermostable enzyme **characterization**
AUTHOR: Jorgensen S; Vorgias C E; *Antranikian G
CORPORATE SOURCE: Novo-Nordisk; Univ.Athens; Univ.Hamburg-Harburg-Tech.Inst.Biotechnol.
LOCATION: Institute of Biotechnology, Department of Technical Microbiology, Technical University Hamburg-Harburg, Denickestrasse 15, 21071 Hamburg, Germany.

SOURCE: J.Biol.Chem.; (1997) 272, 26, 16335-42
CODEN: JBCHA3
ISSN: 0021-9258
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A gene encoding a highly thermostable extracellular alpha-amylase (EC-3.2.1.1) from hyperthermophilic **Pyrococcus furiosus** DSM 3638 was identified. The gene was cloned (plasmid pSJ1678), sequenced and expressed in Escherichia coli and Bacillus subtilis. The gene is 1,383 bp long and encodes a protein of 461 amino acids. The open reading frame of the gene was **purified** by microsequencing of the recombinant **purified** enzyme. The deduced protein sequence was 25 amino acids longer at the N-terminus than that determined by sequencing of the **purified** protein, suggesting that a leader sequence was removed during transport of the enzyme across the membrane. The recombinant alpha-amylase was biochemically **characterized** and showed an optimum at pH 4.5, whereas the optimum temperature for enzymatic activity was close to 100 deg. Alpha-amylase shows sequence homology to the other known alpha-amylases and belongs to family-13 of **glycosylhydrolases.** The extracellular enzyme is not homologous to the subcellular alpha-amylase previously **isolated** from the same organism. (27 ref)

L4 ANSWER 37 OF 39 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 19
ACCESSION NUMBER: 1996:629545 CAPLUS
DOCUMENT NUMBER: 125:269077
TITLE: Enzymic catalysis in organic solvents: polyethylene glycol modified hydrogenase retains sulfhydrogenase activity in toluene
AUTHOR(S): Woodward, Charlene A.; Kaufman, Eric N.
CORPORATE SOURCE: Bioprocessing Research Development Cent., Chem. Technol. Div., Oak Ridge Natl. Lab., Oak Ridge, TN, 37831-6226, USA
SOURCE: Biotechnology and Bioengineering (1996), 52(3), 423-428
CODEN: BIBIAU; ISSN: 0006-3592
PUBLISHER: Wiley
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Naturally occurring enzymes may be modified by covalently attaching hydrophobic groups that render the enzyme soluble and active in organic solvents, and have the potential to greatly expand applications of enzymic catalysis. The reduction of elemental sulfur to hydrogen sulfide by a hydrogenase **isolated** from **Pyrococcus furiosus** was investigated as a model system for organic biocatalysis. Although native hydrogenase catalyzed the reduction of sulfur to H2S in aqueous solution, no activity was observed when the aqueous solvent was replaced with anhydrous toluene. Hydrogenase modified with PEG p-nitrophenyl carbonate demonstrated its native biocatalytic ability in toluene when the reducing dye, benzyl viologen, was also present. Neither benzyl viologen nor PEG p-nitrophenyl carbonate alone demonstrated reducing capability. PEG modified **cellulase** and benzyl viologen were also incapable of reducing sulfur to H2S, indicating that the enzyme itself, and not the modification procedure, is responsible for the conversion in the nonpolar organic solvent. Sulfide production in toluene was 10-fold higher than that produced in an aqueous system with equal enzyme activity, demonstrating the advantages of organic biocatalysis. Applications of bioprocessing in nonaq. media are expected to provide significant advances in the areas of fossil fuels, renewable feedstocks, organic synthesis, and environmental control technol.

L4 ANSWER 38 OF 39 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 91:458408 SCISEARCH

THE GENUINE ARTICLE: GA372
TITLE: THERMOSTABLE CELLOBIOHYDROLASE FROM THE THERMOPHILIC EUBACTERIUM THERMOTOGA SP STRAIN FJSS3-B.1 - **PURIFICATION** AND PROPERTIES
AUTHOR: RUTTERSMITH L D (Reprint); DANIEL R M
CORPORATE SOURCE: UNIV WAIKATO, THERMOPHILE RES UNIT, HAMILTON, NEW ZEALAND (Reprint)
COUNTRY OF AUTHOR: NEW ZEALAND
SOURCE: BIOCHEMICAL JOURNAL, (1991) Vol. 277, No. AUG, pp. 887-890

DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: ENGLISH
REFERENCE COUNT: 23
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Exo-1,4-beta-cellobiohydrolase (EC 3.2.1.91) was **isolated** from the culture supernatant of Thermotoga sp. strain FjSS3-B.1, an extremely thermophilic eubacterium that grows optimally at 80-degrees-C. The enzyme was **purified** to homogeneity as determined by SDS/PAGE and has an M(r) of 36000. The enzyme is the most thermostable **cellulase** reported to date, with a half-life at 108-degrees-C of 70 min in buffer. In a 40 min assay, maximal activity was recorded at 105-degrees-C. Cellobiohydrolase from strain FjSS3-B.1 is active against amorphous cellulose and CM-cellulose but only effects limited hydrolysis of filter paper or Sigmacell 20. The only product identified by h.p.l.c. is the disaccharide cellobiose. The enzyme has a pH optimum around neutral and is stabilized by the presence of 0.8 M-NaCl.

L4 ANSWER 39 OF 39 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:482319 CAPLUS
TITLE: Adsorption of an **Endoglucanase** from the Hyperthermophilic **Pyrococcus furiosus** on Hydrophobic (Polystyrene) and Hydrophilic (Silica) Surfaces Increases Protein Heat Stability
AUTHOR(S): Koutsopoulos, Sotiris; van der Oost, John; Norde, Willem
CORPORATE SOURCE: Laboratory of Physical Chemistry and Colloid Science, Wageningen University, Wageningen, 6703 HB, Neth.
SOURCE: Langmuir ACS ASAP
CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The interaction of an **endoglucanase** from the hyperthermophilic microorganism **Pyrococcus furiosus** with two types of surfaces, i.e., hydrophobic polystyrene and hydrophilic silica, was investigated, and the adsorption isotherms were determined The adsorbed hyperthermostable enzyme did not undergo loss of biol. activity. A model was proposed for the mechanism of interaction of the enzyme with the surface based on the shape of the adsorption isotherm, the morphol. **characteristics** of the enzyme, and the thermodn. parameters of the system. The enzyme was irreversibly immobilized at the solid/liquid interface even at high temps., and most interestingly, it acquired further heat stabilization upon adsorption. The denaturation temperature increased from 108 °C in solution to 116 °C upon adsorption on hydrophilic silica particles. Adsorption on the hydrophobic polystyrene surface even shifted the denaturation temperature to 135 °C, the most extreme exptl. determined protein denaturation temperature ever reported. Maintenance of the biol. function particularly at high temps. is important for the development of solid substrate immobilized enzymes for applications in biocatalysis and biotechnol. This also presents an addnl. stabilization mechanism employed

by nature where the extracellular hyperthermostable enzyme remains folded and active at the extreme temps. of its natural environment by adsorption on the surface of rocks and other materials appearing in the surroundings of the microorganism.

REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d l4 ibib ab 30-39

L4 ANSWER 30 OF 39 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 1999:934067 SCISEARCH
THE GENUINE ARTICLE: 260GJ
TITLE: Synergistic interactions among beta-laminarinase, beta-1,4-glucanase, and beta-glucosidase from the hyperthermophilic archaeon **Pyrococcus furiosus** during hydrolysis of beta-1,4-, beta-1,3-, and mixed-linked polysaccharides
AUTHOR: Driskill L E; Bauer M W; Kelly R M (Reprint)
CORPORATE SOURCE: N CAROLINA STATE UNIV, DEPT CHEM ENGN, BOX 7905, RALEIGH, NC 27695 (Reprint); N CAROLINA STATE UNIV, DEPT CHEM ENGN, RALEIGH, NC 27695
COUNTRY OF AUTHOR: USA
SOURCE: BIOTECHNOLOGY AND BIOENGINEERING, (5 NOV 1999) Vol. 66, No. 1, pp. 51-60.
Publisher: JOHN WILEY & SONS INC, 605 THIRD AVE, NEW YORK, NY 10158-0012.
ISSN: 0006-3592.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 39

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The synergistic interaction among three p-specific glycosidases from the hyperthermophilic archaeon **Pyrococcus furiosus**, namely two **endoglucanases** (EglA and LamA) and an exo-acting p-glucosidase (Bgl), on barley-glucan and laminarin, was examined. In addition to following glucose release and the generation of reducing sugar ends, the distribution and amounts of oligomeric products from beta-1,3- and beta-1,4-linked substrates were determined as a function of extent of hydrolysis at 98 degrees C. Positive interactions were noted between endo/exo glucanase combinations, leading to enhanced and rapid degradation of the larger complex carbohydrates to oligosaccharides. The EgIA/LamA endo-acting combination was also synergistic in degrading barley-glucan. However, hydrolysis was most efficient when a blend of all three hydrolases was used, possibly due to the relief of product inhibition by the exoglyosidase. Furthermore, by monitoring the distribution of oligosaccharides present during hydrolysis, patterns of enzymatic attack could be followed in addition to determining the specific contributions of each hydrolase to the overall process. (C) 1999 John Wiley & Sons, Inc.

L4 ANSWER 36 OF 39 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN
ACCESSION NUMBER: 1997-09654 BIOTECHDS
TITLE: Cloning, sequencing, **characterization**, and expression of an extracellular alpha-amylase from the hyperthermophilic archaeon **Pyrococcus furiosus** in Escherichia coli and Bacillus subtilis; thermostable enzyme **characterization**
AUTHOR: Jorgensen S; Vorgias C E; *Antranikian G
CORPORATE SOURCE: Novo-Nordisk; Univ.Athens; Univ.Hamburg-Harburg-Tech.Inst.Biotechnol.
LOCATION: Institute of Biotechnology, Department of Technical Microbiology, Technical University Hamburg-Harburg, Denickestrasse 15, 21071 Hamburg, Germany.
SOURCE: J.Biol.Chem.; (1997) 272, 26, 16335-42
CODEN: JBCHA3
ISSN: 0021-9258
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A gene encoding a highly thermostable extracellular alpha-amylase (EC-3.2.1.1) from hyperthermophilic **Pyrococcus furiosus** DSM 3638 was identified. The gene was cloned (plasmid pSJ1678), sequenced and expressed in Escherichia coli and Bacillus subtilis. The gene is 1,383 bp long and encodes a protein of 461 amino acids. The open reading frame of the gene was **purified** by microsequencing of the recombinant **purified** enzyme. The deduced protein sequence was 25 amino acids longer at the N-terminus than that determined by sequencing of the **purified** protein, suggesting that a leader sequence was removed during transport of the enzyme across the membrane. The recombinant alpha-amylase was biochemically **characterized** and showed an optimum at pH 4.5, whereas the optimum temperature for enzymatic activity was close to 100 deg. Alpha-amylase shows sequence homology to the other known alpha-amylases and belongs to family-13 of **glycosylhydrolases.** The extracellular enzyme is not homologous to the subcellular alpha-amylase previously **isolated** from the same organism. (27 ref)

Refine Search

Search Results -

Terms	Documents
L1 same (pyrococcus or furiosus)	16

Database: US Pre-Grant Publication Full-Text Database; US Patents Full-Text Database; US OCR Full-Text Database; EPO Abstracts Database; JPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L2

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Wednesday, July 14, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ			
L2	L1 same (pyrococcus or furiosus)	16	L2
L1	endoglucanase or cellulase	10435	L1

END OF SEARCH HISTORY

h e b b cg b e e ch

Hit List

Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Search Results - Record(s) 1 through 16 of 16 returned.

☐ 1. Document ID: US 20030199072 A1

Using default format because multiple data bases are involved.

L2: Entry 1 of 16 File: PGPB Oct 23, 2003

PGPUB-DOCUMENT-NUMBER: 20030199072
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030199072 A1

TITLE: Crystal and structure of a thermostable glycosol hydrolase and use thereof, and modifi proteins

PUBLICATION-DATE: October 23, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Crennell, Susan J.	Bath		GB	
Karlsson, Eva M.N.	Lund		SE	
Hreggvidsson, Gudmundur O.	Reykjavik		IS	
Kristjansson, Jakob K.	Gardabaer		IS	
Aevarsson, Arnthor	Hveragerdi		IS	

US-CL-CURRENT: 435/200; 702/19

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20030135885 A1

L2: Entry 2 of 16 File: PGPB Jul 17, 2003

PGPUB-DOCUMENT-NUMBER: 20030135885
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030135885 A1

TITLE: Self-processing plants and plant parts

PUBLICATION-DATE: July 17, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lanahan, Michael B.	Research Triangle Park	NC	US	
Basu, Shib Sankar	Apex	NC	US	
Batie, Christopher J.	Durham	NC	US	
Chen, Wen	Cary	NC	US	
Craig, Joyce	Pittsboro	NC	US	
Kinkema, Mark	Durham	NC	US	

h e b b g e e e f e ef b e

US-CL-CURRENT: 800/284; 435/200, 435/320.1, 435/419, 435/6, 435/69.1, 536/23.2, 800/294

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 3. Document ID: US 20030129723 A1

L2: Entry 3 of 16 File: PGPB Jul 10, 2003

PGPUB-DOCUMENT-NUMBER: 20030129723
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030129723 A1

TITLE: Thermophilic endoglucanase

PUBLICATION-DATE: July 10, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Ishikawa, Kazuhiko	Osaka		JP	
Ishida, Hiroyasu	Ibaraki		JP	
Kosugi, Yoshitsugu	Ibaraki		JP	
Ando, Susumu	Osaka		JP	
Shimomura, Akio	Shiga		JP	

US-CL-CURRENT: 435/200; 435/252.3, 435/320.1, 435/325, 435/348, 435/419, 435/69.1, 536/23.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 4. Document ID: US 20030078397 A1

L2: Entry 4 of 16 File: PGPB Apr 24, 2003

PGPUB-DOCUMENT-NUMBER: 20030078397
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030078397 A1

TITLE: Enzymes having glycosidase activity and methods of use thereof

PUBLICATION-DATE: April 24, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Short, Jay M.	Rancho Santa Fe	CA	US	
Bylina, Edward	San Diego	CA	US	
Swanson, Ronald V.	La Jolla	CA	US	
Mathur, Eric	Carlsbad	CA	US	
Lam, David E.	Carlsbad	CA	US	

US-CL-CURRENT: 536/23.1

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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h e b b g e e e f e ef b e

☐ 5. Document ID: US 20020155550 A1

L2: Entry 5 of 16 File: PGPB Oct 24, 2002

PGPUB-DOCUMENT-NUMBER: 20020155550
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020155550 A1

TITLE: Glycosidase enzymes

PUBLICATION-DATE: October 24, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bylina, Edward J.	San Diego	CA	US	
Swanson, Ronald V.	Del Mar	CA	US	
Mathur, Eric J.	Carlsbad	CA	US	
Lam, David E.	Carlsbad	CA	US	

US-CL-CURRENT: 435/105; 435/200

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 6. Document ID: US 20020102699 A1

L2: Entry 6 of 16 File: PGPB Aug 1, 2002

PGPUB-DOCUMENT-NUMBER: 20020102699
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020102699 A1

TITLE: Thermostable cellulase

PUBLICATION-DATE: August 1, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Wicher, Krzysztof B.	Krakow		PL	
Holst, Olof Peder	Lund		SE	
Hachem, Maher Youssef Abou	Lund		SE	
Karlsson, Eva Margareta Nordberg	Lund		SE	
Hreggvidsson, Gudmundur O.	Reykjavik		IS	

US-CL-CURRENT: 435/209; 435/320.1, 435/410, 435/69.1, 536/23.2

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 7. Document ID: US 6566113 B1

L2: Entry 7 of 16 File: USPT May 20, 2003

US-PAT-NO: 6566113
DOCUMENT-IDENTIFIER: US 6566113 B1

h e b b g e e e f e ef b e

TITLE: Polypeptide having cellobiohydrolase activity

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 8. Document ID: US 6503729 B1

L2: Entry 8 of 16 File: USPT Jan 7, 2003

US-PAT-NO: 6503729
DOCUMENT-IDENTIFIER: US 6503729 B1

TITLE: Selected polynucleotide and polypeptide sequences of the methanogenic archaeon, methanococcus jannashii

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 9. Document ID: US 6368844 B1

L2: Entry 9 of 16 File: USPT Apr 9, 2002

US-PAT-NO: 6368844
DOCUMENT-IDENTIFIER: US 6368844 B1
** See image for Certificate of Correction **

TITLE: Glycosidase enzymes

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 10. Document ID: US 6126698 A

L2: Entry 10 of 16 File: USPT Oct 3, 2000

US-PAT-NO: 6126698
DOCUMENT-IDENTIFIER: US 6126698 A

TITLE: Continuous biopolishing of cellulose-containing fabrics

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 11. Document ID: US 6068973 A

L2: Entry 11 of 16 File: USPT May 30, 2000

US-PAT-NO: 6068973
DOCUMENT-IDENTIFIER: US 6068973 A

TITLE: Methods for inhibition of membrane fusion-associated events, including influenza virus

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 12. Document ID: US 5942424 A

h e b b g e e e f e ef b e

L2: Entry 12 of 16 File: USPT Aug 24, 1999

US-PAT-NO: 5942424
DOCUMENT-IDENTIFIER: US 5942424 A

TITLE: Method for the enzymatic production of hydrogen

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 13. Document ID: US 5747320 A

L2: Entry 13 of 16 File: USPT May 5, 1998

US-PAT-NO: 5747320
DOCUMENT-IDENTIFIER: US 5747320 A

TITLE: Glucose and cellobiose tolerant .beta.-glucosidase from Candida peltata

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 14. Document ID: US 20030129723 A1, JP 2003210182 A

L2: Entry 14 of 16 File: DWPI Jul 10, 2003

DERWENT-ACC-NO: 2004-106474
DERWENT-WEEK: 200411

TITLE: New thermophilic endoglucanase from Pyrococcus horikoshii, useful for treating crystalloid cellulose and cellulose fibers at high temperatures, e.g. for biopolishing new fabric (enzymatic finishing), or for stone-washing denim

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 15. Document ID: WO 9744361 A1, AU 9732852 A, US 5789228 A, EP 923608 A1, US 6001984 A, AU 719444 B, US 6074867 A, JP 2000512842 W, US 6329187 B1

L2: Entry 15 of 16 File: DWPI Nov 27, 1997

DERWENT-ACC-NO: 1998-018435
DERWENT-WEEK: 200275

TITLE: Endo:glucanase(s), preferably form archael bacterium, AEPII 1a - useful to degrade carboxy:methylcellulose and hydrolyse of beta-1,4-glycosidic bonds in cellulose

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

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☐ 16. Document ID: WO 9725417 A1, AU 9722410 A, EP 912725 A1, AU 726017 B, JP 2002509425 W JP 2004000189 A

L2: Entry 16 of 16 File: DWPI Jul 17, 1997

h e b b g e e e f e ef b e

DERWENT-ACC-NO: 1997-372858
DERWENT-WEEK: 200409

TITLE: New thermostable glycosidase(s) - from Thermococcus, Staphylothermus and Pyrococcus, used in the textile, food processing, pharmaceutical, detergent and baking industries

Terms	Documents
L1 same (pyrococcus or furiosus)	16

n e b b g e e e f e ef b e